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EXAMINER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MICHAEL F. RUBNER, SUNG YUN YANG, YONGXING QIU
QIU, LYNN COOK WINTERTON, and JOHN MARTIN LALLY¹

Appeal 2016-005868
Application 14/135,666
Technology Center 1600

Before FRANCISCO C. PRATS, RICHARD J. SMITH, and
RACHEL H. TOWNSEND, *Administrative Patent Judges*.

SMITH, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 involving claims to a medical device. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

STATEMENT OF THE CASE

Background

“Contact lenses are often exposed to one or more microorganisms during wear, storage and handling. They can provide surfaces onto which

¹ According to Appellants, the real party in interest is Novartis AG. (Appeal Br. 3.)

the microorganisms can adhere and then proliferate to form a colony.”

(Spec. 1, ll. 11–13.)

“Currently, a wide variety of antimicrobial agents have been proposed to be used as coatings for contact lenses . . . [h]owever, such antimicrobial coatings have disadvantages and are unsatisfactory.” (*Id.* 2, ll. 16–21.)

Claims on Appeal

Claims 19–23 are on appeal.² (Claims Appendix, Appeal Br. 10.)

Claim 19 is illustrative and reads as follows:

19. A medical device comprising a core material and an antimicrobial metal-containing LbL coating that is not covalently attached to the medical device and can impart to the medical device an increased hydrophilicity, wherein the antimicrobial metal-containing LbL coating comprises at least one layer of a coating material having –COOAg groups and silver nanoparticles formed by autoclaving the core material and the coating to reduce Ag⁺ ions associated with the –COO[–] groups of the negatively charged polyionic material, wherein the medical device having the silver nano-particle-containing antimicrobial LbL coating exhibits at least 50% inhibition of viable microorganisms.

Examiner’s Rejection

Claims 19–23 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Winterton³ and Wang,⁴ as evidenced by Pratt⁵ and/or Burrell.⁶ (Final

² The term “LbL coating” is defined by Appellants in their Specification as “a coating that is not covalently attached to an article, preferably a medical device, and is obtained through a layer-by-layer (‘LbL’) deposition of polyionic or charged materials on an article.” (Spec. 5, ll. 28–30.)

³ Winterton et al., US 2001/0045676 A1, pub. Nov. 29, 2001 (“Winterton”).

⁴ Wang et al., *Metallodielectric Photonic Structures Based on Polyelectrolyte Multilayers*, Adv. Mater. 14(21), 1534–37 (2002) (“Wang”).

⁵ Pratt et al., US 4,849,223, issued July 18, 1989 (“Pratt”).

⁶ Burrell et al., US 5,681,575, issued Oct. 28, 1997 (“Burrell”).

Act. 2–6.)⁷

FINDINGS OF FACT

We adopt the Examiner’s findings as our own, including with regard to the scope and content of, and motivation to combine, the prior art. The following findings are included for emphasis and reference purposes.

FF 1. The Examiner finds that “Winterton teaches biomedical devices, such as ophthalmic lenses, and methods of making such devices having a surface coating including at least one polyionic layer.” (Final Act. 3, citing Winterton Abstract.)

FF 2. The Examiner finds that the coating taught by Winterton is formed by layering a polycationic material, such as poly(allylamine hydrochloride) (PAH), and a polyanionic material such as polyacrylic acid (PAA), and that the coating is added to the lens in order to alter the surface properties. (Final Act. 3, citing Winterton ¶¶ 22, 43, 63–64, 70, 72, and 194–195.)

FF 3. The Examiner finds that the coating of Winterton can include other additives, such as antimicrobials. (Final Act. 3, citing Winterton ¶ 94.)

FF 4. The Examiner finds that Wang teaches “that an LBL coating assembly, such as PAH/PAA, may have in-situ nanoparticulate synthesis with silver to form silver nanoparticles.” (Final Act. 3, citing Wang 1534 and 1537.)

FF 5. The Examiner finds that Wang “teaches that LbL assembly affords precise control over layer thicknesses, and in-situ nanoparticulate synthesis facilitates the tuning of refractive index within specified regions of these layers.” (Final Act. 3, citing Wang 1534.)

⁷ Office Action dated June 24, 2015.

FF 6. The Examiner finds that

Wang teaches that the Ag nanoparticle concentration can be systematically tuned via PAH/PAA assembly pH, which controls the carboxylic acid group concentration available for silver cation exchange, and the multiple cycling of the nanoparticle synthesis . . . and therefore it would be within the purview of the skilled artisan to have both –COOAg groups and silver nanoparticles present, absent evidence to the contrary.

(Final Act. 5, citing Wang 1535.)

FF 7. The Examiner finds that

one skilled in the art, looking to improve the surface properties of an ophthalmic lens coated with a Lbl assembly of PAA/PAH (the invention of Winterton), would look to the teachings of Wang and consider them relevant, since Wang is also concerned with Lbl assembly of PAA/PAH, and would be motivated to utilize the teachings of Wang and add nanoparticulate silver ions by in-situ nanoparticulate synthesis to the Lbl assembly of Winterton [], since this would provide improved tuning of the refractive index within the layers of the Lbl assembly, thereby improving the surface properties of the lens.

(Final Act. 4.)

FF 8. The Examiner finds that “silver is known to possess antimicrobial activity when present in a medical device, such as a contact lens, as evidenced by Pratt and/or Burrell,” and that “the skilled artisan would reasonably expect the antimicrobial coating to exhibit at least 50% inhibition of viable microorganisms, absent evidence to the contrary.” (Final Act. 4–5, citing Pratt col. 1, ll. 23–31 and Burrell col. 15, Example 10.)

FF 9. The Examiner finds that Winterton and Wang are analogous art.

(Ans. 5.)

FF 10. The Examiner finds that one of skill in the art “would reasonably expect success from the addition of nanoparticulate silver ions to the

multilayer assembly of Winterton [] because [Winterton and Wang] are drawn to multilayer assemblies based on PAH and PAA.” (Final Act. 4.)

DISCUSSION

We adopt as our own the Examiner’s findings, analysis, and conclusions as set forth in the Final Action (Final Act. 2–8) and Answer (Ans. 2–7). We discern no error in the rejection of the claims as obvious.

Issue

Whether a preponderance of evidence of record supports the Examiner’s rejection under 35 U.S.C. § 103(a).

Analysis

Appellants contest the obviousness conclusion by advancing several arguments, which are addressed below. We limit our consideration to claim 19 because the claims were not argued separately.

We note at the outset that the rejection is based on the combination of Winterton and Wang, *as evidenced* by Pratt and Burrell. (Final Act. 2–3.) Winterton teaches the surface coating of a contact lens, wherein the coating may comprise layers of PAA/PAH and include an antimicrobial. (FF 1–3.) Wang teaches an LbL assembly of PAA/PAH using silver nanoparticles, which are known to have antimicrobial activity *as evidenced* by Pratt and Burrell. (FF 4, 5, and 8.) Accordingly, Appellants’ arguments regarding Pratt and Burrell that are beyond the scope of evidencing silver’s antimicrobial activity (e.g., Appeal Br. 4–5, 8) are unpersuasive because they do not properly address the rejection and otherwise fail to show error on the part of the Examiner.

Argument No. 1

Appellants argue that the cited references do not disclose or suggest “all of the limitations of the invention as currently claimed.” (Appeal Br. 4.) In particular, Appellants argue that Winterton “does not teach medical device having the silver nano-particle-containing antimicrobial LbL coating exhibits at least 50% inhibition of viable microorganisms,” and that Wang, Pratt, and Burrell “cannot fill the gaps left by” Winterton. (*Id.*) Appellants’ also argue that Burrell does not teach that nanocrystalline silver powder produces an antimicrobial effect. (Appeal Br. 4–6.)

We are not persuaded. The test for obviousness is “what the combined teachings of the references would have suggested to those of ordinary skill in the art.” *In re Keller*, 642 F.2d 413, 425 (CCPA 1981) (citing cases). Here, the Examiner has established that all of the claimed limitations are taught or suggested by the combined teachings of the prior art. (FF 1–9.)

Appellants’ arguments regarding Burrell’s teachings are unpersuasive. Burrell clearly teaches that nanocrystalline silver powder has antimicrobial activity, as well as the conditions under which the anti-microbial effect of silver nanoparticles may be “improved.” (See Burrell Example 10; FF 8; Ans. 4.)

Argument No. 2

Appellants argue that the Examiner has not adequately explained why one skilled in the art would combine Winterton and Wang. (Appeal Br. 6–8.) In particular, Appellants argue that Wang’s teachings regarding tuning the refractive index are not applicable to a contact lens because a contact lens needs a constant refractive index and the release of silver nanoparticles

to provide an antimicrobial property will change the refractive index of the contact lens. (Appeal Br. 7–8.)

We are not persuaded. The Examiner has explained why one of skill in the art would combine Winterton and Wang. (FF 7.) Moreover, contrary to Appellants’ arguments, we find that Wang is analogous art, at least because we find that Wang’s teachings of the assembly of layered coatings of PAH/PAA that also include a known antimicrobial element (FF 4) are “at least ‘reasonably pertinent to the particular problem with which the inventor is involved.’” *In re Ethicon*, 844 F. 3d 1344, 1351 (Fed. Cir. 2017) (quoting *In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992)). In addition, Appellants acknowledge that “[a]n invention may improve certain properties [and] may compromise other properties.” (Reply Br. 4.) *See, e.g., Medichem, S.A. v Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (“[A] given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.”). Here, while the use of silver nanoparticles in the coating of Winterton may also have certain disadvantages, we are not persuaded that such overrides the Examiner’s identified motivation to combine articulated in Wang, i.e., that the in situ nanoparticle synthesis facilitates tuning of refractive index within the PAH/PAA layers, or that the Examiner erred in combining the teachings of Winterton and Wang.

Argument No. 3

Appellants argue that the Examiner has not explained how one skilled in the art would have a reasonable expectation of success to arrive at the claimed invention. (Appeal Br. 8.) To the extent those arguments focus on Pratt and Burrell, they are unpersuasive for the reasons stated above.

Moreover, the Examiner has explained why one of skill in the art would have a reasonable expectation of success, and we discern no error in that finding. (FF 10.)

Appellants also argue that a person of skill in the art would know that certain process steps referred to in Wang would cause the “contact lens [to] be destroyed.” (Reply Br. 5.) Appellants provide no evidence for this statement or, even if true, why a person of ordinary skill in the art would thus not be able to utilize the teachings of Wang in connection with a medical device. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007) (“A person of ordinary skill is also a person of ordinary creativity, not an automaton.”); *In re Sovish*, 769 F.2d 738, 743 (Fed. Cir. 1985) (skill is presumed on the part of one of ordinary skill in the art). The argument regarding destruction of a contact lens is also unpersuasive because the reasonable expectation of success requirement “refers to the likelihood of success in combining references to meet the limitations of the claimed invention.” *Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367 (Fed. Cir. 2016). Claim 19 recites a “medical device,” a term that is not limited to a contact lens. (*See Spec.* 4, ll. 20–30.)

Argument No. 4

Appellants argue that Burrell teaches away from the claim limitation of 50% inhibition of viable microorganisms. (Appeal Br. 8–9.) Burrell was cited as evidence of the antimicrobial activity of silver nanoparticles. (FF 8.) Moreover, we are not persuaded that Burrell teaches away because Appellants have not explained how Burrell criticizes, discredits, or otherwise discourages the claimed invention, particularly the use of silver

nanoparticles as an antimicrobial. *See In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004).⁸

Conclusion of Law

A preponderance of evidence of record supports the Examiner's rejection of claim 19 under 35 U.S.C. § 103(a). Claims 20–23 were not argued separately and fall with claim 19.

SUMMARY

We affirm the rejection of all claims on appeal.

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

⁸ We also acknowledge, but are unpersuaded by, Appellants' argument regarding "hindsight reconstruction." (Reply Br. 5.) Appellants point to no evidence that any of the Examiner's findings were beyond the level of ordinary skill at the time of the invention or could have been taken only from Appellants' Specification. *See In re McLaughlin*, 443 F.2d 1392, 1395 (CCPA 1971).